

CLAIMS

We claim:

- 1) A method of coating a blood-contacting surface with a heparin-containing compound comprising:
 - a) applying a first hemocompatible coating to said surface wherein said first hemocompatible coating is sufficiently tightly bonded to said surface so as to remain on said surface in contact with blood; and,
 - b) applying at least one second hemocompatible coating sequentially on said first hemocompatible coating wherein said at least one second hemocompatible coating comprises one or more therapeutic heparin-containing compounds releasable into blood.
- 2) A method as in claim 1 wherein said first hemocompatible layer includes a heparin-containing compound.
- 3) A method as in claim 1 further comprising roughening said surface prior to coating.
- 4) A method as in claim 1 further comprising applying a primer layer to said surface prior to applying said first hemocompatible coating, wherein said primer layer enhances adhesion of said first hemocompatible coating to said surface.
- 5) A method as in claim 4 wherein said primer layer is selected from the group consisting of heparin-containing compounds, ethylene vinyl alcohol copolymer, polycystine, polylysine and reactive silanes including trimethoxysilanes.
- 6) A method as in claim 4 wherein said primer layer contains at least one chlorosilane compound.

7) A method as in claim 6 wherein said at least one chlorosilane has a functional head.

8) A method as in claim 7 wherein said functional head of said at least one
5 chlorosilane has functionality selected from the group consisting of unsaturated functionality, amine functionality, carboxyl functionality.

9) A method as in claim 8 wherein said functionality is modified by polyethylene glycol or hyaluronic acid.

10 10) A method as in claim 7 wherein said at least one second hemocompatible layer comprises a plurality of layers and wherein said plurality of layers have varying properties.

15 11) A method as in claim 10 wherein said varying properties comprise varying compositions.

12) A material having a hemocompatible surface produced by the method of claim
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20 13) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of said blood contacting surface is the material of claim
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25 14) A medical device as in claim 13 wherein said medical device is an endoluminal stent.

15) A method of coating a blood-contacting surface with a heparin-containing compound comprising:

30 a) providing a formulation containing at least one heparin-containing compound and at least one adhesion enhancer; and,

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- b) coating said surface with said formulation.
- 16) A method as in claim 15 wherein said at least one adhesion enhancer is selected from the group consisting of polyethylene glycol, polyethylene oxide, 5 polyvinylpyrrolidone, polyvinyl alcohol, polycaprolactone, polyglycolic acid, ethylene vinyl alcohol copolymer, hyaluronic acid, polyurethanes, copolymers of polycaprolactone and polyglycolic acid, copolymers of polycaprolactone and polyethylene glycol, segmented polyurethanes and mixtures thereof.
- 10 17) A method as in claim 16 wherein said coating is performed by dip coating.
- 18) A method as in claim 15 further comprising roughening said surface prior to coating.
- 15 19) A material having a hemocompatible surface produced by the method of claim 15.
- 20) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of said blood contacting surface is the material of claim 20 19.
- 21) A medical device as in claim 20 wherein said medical device is an endoluminal stent.
- 25 22) A method of coating a blood-contacting surface with a heparin-containing compound comprising:
- 30 a) roughening said surface prior to coating; and,
- b) coating said surface with a heparin-containing compound; and,
- c) baking said surface and said coating thereon sufficient to affix said coating to said surface.

23) A method as in claim 22 wherein said baking is at a temperature from approximately 50 degree C to approximately 100 degree C.

24) A method as in claim 22 wherein said coating is performed by dip coating.

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25) A method as in claim 22 wherein said roughening is performed by argon plasma etching.

10 26) A material having a hemocompatible surface produced by the method of claim 22.

15 27) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of said blood contacting surface is the material of claim 26.

28) A medical device as in claim 27 wherein said medical device is an endoluminal stent.

20 29) A heparin-containing composition for coating onto a blood-contacting surface comprising ethylene vinyl alcohol copolymer, at least one heparin complex, dimethyl sulfoxide and tetrahydrofuran.

30) A heparin-containing composition as in claim 29 further comprising dimethyl acetamide.

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31) A heparin-containing composition as in claim 29 wherein said ethylene vinyl alcohol copolymer is about 2.2% by weight of said composition.

30 32) A heparin-containing composition as in claim 31 wherein said heparin complex is from about 0.6% by weight to about 2.3% by weight of said composition.

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- 33) A heparin-containing composition as in claim 30 wherein said ethylene vinyl alcohol copolymer is about 2% by weight of said composition.
 - 5 34) A heparin-containing composition as in claim 31 wherein said heparin-complex is from about 1.1% by weight to about 2.0% by weight of said composition.
 - 10 35) A medical device wherein at least one surface thereof contacts blood and wherein at least a portion of said blood contacting surface is coated with the material of claim 29.
 - 36) A medical device as in claim 35 wherein said medical device is an endoluminal stent.

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